



**Dean Millivolt Gas Fryers
(Non-CE)
Installation & Operation Manual**

**Models SM20, SM35, SM40, SM50, SM60 & SM80
NON-CE ONLY**



Dean, a member of the Commercial Food Equipment Service Association, recommends using CFESA Certified Technicians.

24-Hour Service Hotline 1-800-551-8633

MAY 2007

8195895

Please read all sections of this manual and retain for future reference.

NOTICE

This appliance is intended for professional use only and is to be operated by qualified personnel only. A Dean Factory Authorized Service Center (FASC) or other qualified professional should perform installation, maintenance, and repairs. Installation, maintenance, or repairs by unqualified personnel may void the manufacturer's warranty.

NOTICE

This equipment must be installed in accordance with the appropriate national and local codes of the country and/or region in which the appliance is installed. See NATIONAL CODE REQUIREMENTS in Chapter 3 of this manual for specifics.

NOTICE

Drawings and photos used in this manual are intended to illustrate operational, cleaning and technical procedures and may not conform to onsite management operational procedures.

NOTICE

IF, DURING THE WARRANTY PERIOD, THE CUSTOMER USES A PART FOR THIS ENODIS EQUIPMENT OTHER THAN AN UNMODIFIED NEW OR RECYCLED PART PURCHASED DIRECTLY FROM FRYMASTER/DEAN, OR ANY OF ITS AUTHORIZED SERVICE CENTERS, AND/OR THE PART BEING USED IS MODIFIED FROM ITS ORIGINAL CONFIGURATION, THIS WARRANTY WILL BE VOID. FURTHER, FRYMASTER/DEAN AND ITS AFFILIATES WILL NOT BE LIABLE FOR ANY CLAIMS, DAMAGES OR EXPENSES INCURRED BY THE CUSTOMER WHICH ARISE DIRECTLY OR INDIRECTLY, IN WHOLE OR IN PART, DUE TO THE INSTALLATION OF ANY MODIFIED PART AND/OR PART RECEIVED FROM AN UNAUTHORIZED SERVICE CENTER.

 DANGER

Improper installation, adjustment, maintenance or service, and unauthorized alterations or modifications can cause property damage, injury, or death. Read the installation, operating and service instructions thoroughly before installing or servicing this equipment. Only qualified service personnel may convert this appliance to use a gas other than that for which it was originally configured.

 DANGER

Adequate means must be provided to limit the movement of this appliance without depending upon the gas line connection. Single fryers equipped with legs must be stabilized by installing anchor straps. All fryers equipped with casters must be stabilized by installing restraining chains. If a flexible gas line is used, an additional restraining cable must be connected at all times when the fryer is in use.

⚠ DANGER

The front ledge of the fryer is not a step. Do not stand on the fryer. Serious injury can result from slips or contact with the hot oil.

⚠ DANGER

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other cooking appliance.

⚠ DANGER

Instructions explaining procedures to be followed **MUST** be posted in a prominent location in the event the operator detects a gas leak. This information can be obtained from the local gas company or gas supplier.

⚠ DANGER

The crumb tray in fryers equipped with a filter system must be emptied into a fireproof container at the end of frying operations each day. Some food particles can spontaneously combust if left soaking in certain shortening material. Additional information can be obtained in the filtration manual included with the system.

⚠ WARNING

No structural material on the fryer should be altered or removed to accommodate placement of the fryer under a hood. Questions? Call the Dean Service Hotline at 1-800-551-8633.

⚠ WARNING

Do not bang fry baskets or other utensils on the fryer's joiner strip. The strip is present to seal the joint between the frypot. Banging fry baskets on the strip to dislodge shortening will distort the strip, adversely affecting its fit. It is designed for a tight fit and should only be removed for cleaning.

IMPORTANT

Safe and satisfactory operation of Dean equipment depends upon its proper installation. Installation **MUST** conform with local codes, or in the absence of local codes, to European Community (CE) Standards.

NOTICE

The Commonwealth of Massachusetts requires any and all gas products to be installed by a licensed plumber.



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DEAN MILLIVOLT GAS FRYERS (NON-CE)

CHAPTER 1: INTRODUCTION

1.1 After Purchase

In order to improve service, have the following chart filled in by the Dean Authorized Service Technician who installed this equipment.

Authorized Service Technician/FASC	_____
Address	_____

Telephone/Fax	_____
Model Number	_____
Serial Number	_____
Gas Type	_____

1.2 Ordering Parts

Customers may order parts directly from their local Authorized Parts Distributor. For this address and phone number, contact your maintenance and repair center or call the factory. The factory address and phone numbers are on the back cover of this manual.

To speed up your order, the following information is required:

Model Number	_____	Type	_____
Serial Number	_____		_____
Optional Equipment	_____		_____
Item Part Number	_____	Quantity Needed	_____

1.3 Service Information

Call the 1-800-551-8633 or (318) 865-1711 Service Hotline number for the location of your nearest maintenance and repair center. Always give the model and serial numbers of your fryer.

To assist you more efficiently, the following information will be needed:

Model Number	_____	Type	_____
Serial Number	_____		_____
Optional Equipment	_____		_____
Nature of Problem	_____		_____
	_____		_____

Additional information (i.e. cooking environment, time of day, and other pertinent information) may be helpful in solving your service problem.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 1: INTRODUCTION**

1.4 Safety Information

Before attempting to operate your unit, read the instructions in this manual thoroughly.

Throughout this manual, you will find notations enclosed in double-bordered boxes similar to the ones below.

CAUTION boxes contain information about actions or conditions that *may cause or result in a malfunction of your system.*

 **CAUTION**
Example of a **CAUTION** box.

WARNING boxes contain information about actions or conditions that *may cause or result in damage to your system*, and which may cause your system to malfunction.

 **WARNING**
Example of a **WARNING** box.

DANGER boxes contain information about actions or conditions that *may cause or result in injury to personnel*, and which may cause damage to your system and/or cause your system to malfunction.

 **DANGER**
Hot cooking oil/shortening causes severe burns. Never attempt to move a fryer containing hot cooking oil/shortening or to transfer hot cooking oil/shortening from one container to another.

1.5 Service Personnel

1.5.1 Definitions

A. Qualified and/or Authorized Operating Personnel

1. Qualified/authorized operating personnel are those who have carefully read the information in this manual and have familiarized themselves with the equipment functions, or have had previous experience with the operation of equipment covered in this manual.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 1: INTRODUCTION**

1.5.1 Definitions (cont.)

B. Qualified Installation Personnel

1. Qualified installation personnel are individuals, or firms, corporations, or companies, which, either in person or through a representative are engaged in and are responsible for the installation of gas-fired appliances. Qualified personnel must be experienced in such work, be familiar with all gas precautions involved, and have complied with all requirements of applicable national and local codes.

C. Qualified Service Personnel

1. Qualified service personnel are those who are familiar with Dean equipment and have been authorized by Dean to perform service on Dean equipment. All authorized service personnel are required to be equipped with a complete set of service parts manuals and stock a minimum amount of parts for Dean equipment. A list of Dean Factory Authorized Service Centers (FASCs) was included with the fryer when shipped from the factory. ***Failure to use qualified service personnel will void the Dean warranty on your equipment.***

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DEAN MILLIVOLT GAS FRYERS (NON-CE)

CHAPTER 2: IMPORTANT INFORMATION

2.1 Receiving and Unpacking Equipment

- A. Check that the container is upright. Use an outward prying motion - *no hammering* - to remove the carton. Unpack the fryer carefully and remove all accessories from the carton. Do not discard or misplace these, as they will be needed.
- B. After unpacking, immediately check the equipment for visible signs of shipping damage. If damage has occurred, contact the carrier and file the appropriate freight claims. Do not contact the factory. Shipping damage responsibility is between the carrier and the dealer.

If your equipment arrives damaged:

1. File claim for damages immediately, regardless of extent of damage.
2. Visible loss or damage: Be sure this is noted on the freight bill or express receipt and is signed by the person making the delivery.
3. Concealed loss or damage: If damage is unnoticed until equipment is unpacked, notify freight company or carrier immediately, and file a concealed damage claim. This should be done within 15 days of date of delivery. Be sure to retain container and all packing materials for inspection.

NOTE: Dean Does Not Assume Responsibility for Damage or Loss Incurred in Transit.

- C. Remove all plastic skin from sides, front, and doors of the fryer(s). Failure to do this prior to initial fryer operation will make it very difficult to remove later.

2.2 General

Qualified, licensed, and/or authorized installation or service personnel only (as defined in Section 1.5) should perform the following:

- **Installation and service on Dean equipment.**
- **Conversion of this appliance from one gas type to another.**

Failure to use qualified, licensed, and/or authorized installation or service personnel to install, convert to another gas type or otherwise service this equipment will void the Dean warranty and may result in damage to the equipment or injury to personnel.

Where conflicts exist between instructions and information in this manual and local code or national codes, or regulations, installation and operation shall comply with the codes or regulations in force in the country in which the equipment is installed.

DEAN MILLIVOLT GAS FRYERS (NON-CE) CHAPTER 2: IMPORTANT INFORMATION

2.2 General (cont.)

Dean Super Marathon Series gas fryers are energy efficient, gas-fired units, design certified by (Approvals Pending), and manufactured to their basic performance and application specifications.

All units are shipped completely assembled with accessories packed inside the frypots. All units are adjusted, tested and inspected at the factory before shipment. Sizes, weights and input rates of all models are listed in this manual.

WARNING

The on-site supervisor is responsible for ensuring that operators are made aware of the inherent dangers of operating a hot-oil fryer/filter system, particularly the aspects of fryer operation, oil filtration, and draining/cleaning procedures.

2.3 Principles of Operation

The incoming gas flows through orifices and is mixed with air in the burners to create the correct ratio for proper combustion. The mixture is ignited at the front end of each heat tube by the pilot light. Internal diffusers slow the flame as it goes through the burner tube. This slower and more turbulent flame gives much better heat transfer to the walls of the tubes, thereby heating the oil more efficiently.

2.4 Rating Plate

This is attached to the inside front door panel. Information provided includes the model and serial number of the fryer, BTU/hr input of the burners, outlet gas pressure in inches W.C. and whether the unit has natural or propane gas orifices.

DANGER

Fryers **MUST be connected **ONLY** to the gas type identified on the attached rating plate.**

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 2: IMPORTANT INFORMATION**

2.5 Pre-Installation

 **DANGER**

No structural material on the fryer should be altered or removed to accommodate placement of the fryer under a hood. Questions? Call the Frymaster/Dean Service Hotline at 1-800-551-8633.

 **DANGER**

Do not connect this appliance to the gas supply before reviewing all information in this chapter.

- A. **General:** Only licensed personnel should install any gas-fired equipment.
1. A manual gas shut-off valve must be installed in the gas supply line ahead of the fryers for safety and ease of future service.
 2. Dean Super Marathon Series gas fryers operate on millivolts, and do not require an external electric power supply (unless equipped with built-in filtration system).
- B. **Clearances:** The fryer area must be kept free and clear of all combustibles. This unit is design-certified for the following installations:
1. Commercial installation only (not for household use).
 2. Non-combustible floor installation equipped with factory-supplied 6-inch (15-cm) adjustable legs or 5-inch (13-cm) casters;
 3. Combustible construction with a minimum clearance of 6-inches (15-cm) side and 6-inches (15-cm) rear, and equipped with factory-supplied 6-inch (15-cm) adjustable legs or 5-inch (13-cm) casters.

 **DANGER**

Local building codes prohibit a fryer with its open tank of hot oil from being installed beside an open flame of any type, including those of broilers and ranges.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 2: IMPORTANT INFORMATION**

2.5 Pre-Installation (cont.)

C. Installation Standards

1. INSTALLATION STANDARDS: Fryer installation must conform with local codes, or in the absence of local codes, to the appropriate national standards as listed below:

<p>a. <u>U.S. installations must meet:</u></p> <p>American National Standard Institute ANSI Z83.11 American Gas Association 8501 E. Pleasant Valley Road Cleveland, OH 44131</p> <p>National Electrical Code ANSI/NFPA #70 American National Standard Institute 1430 Broadway New York, NY 10018</p> <p>NFPA Standards #96 and #211 National Fire Protection Association 470 Atlantic Avenue Boston, MA 02110</p>	<p>b. <u>Canadian installations must meet:</u></p> <p>CAN 1-B149 Installation Codes Canadian Gas Association 55 Scarsdale Road Don Mills, ONT, M3B 2R3</p> <p>Canadian Electric Code c22.1, part 1 Canadian Standards Association 178 Rexdale Blvd. Rexdale, ONT, M9W 1R3</p>
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D. Australian Requirements

To be installed in accordance with AS 5601 / AG 601, local authority, gas, electricity, and any other relevant statutory regulations.

2.6 Equipment Installed at High Altitudes

1. The fryer input rating [BTU/hr (kW/hr)] is for elevations up to 2,000 feet (610-m). For elevations above 2,000 feet (610-m), the rating should be reduced 4-percent for each additional 1,000 feet (305-m) above sea level.
2. The correct orifices are installed at the factory if the operating altitude is known at the time of the customer's order.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 2: IMPORTANT INFORMATION**

2.7 Air Supply and Ventilation



This appliance must be installed with sufficient ventilation to prevent the occurrence of unacceptable concentrations of substances harmful to the health of personnel in the room in which it is installed.

2.7 Air Supply and Ventilation (cont.)

Keep the area around the fryer clear to prevent obstruction of combustion and ventilation airflow.

1. Do not connect this fryer to an exhaust duct.
2. Correct installation and adjustment will ensure adequate airflow to the fryer system.
3. A commercial, heavy-duty fryer must vent its combustion wastes to the outside of the building. A deep-fat fryer must be installed under a powered exhaust hood, or an exhaust fan must be provided in the wall above the unit, as exhaust gas temperatures are approximately 800-1000°F (427-538°C). Check air movement during installation. Strong exhaust fans in the exhaust hood or in the overall air conditioning system can produce slight air drafts in the room.
4. Do not place the fryer's flue outlet directly into the plenum of the hood, as it will affect the gas combustion of the fryer.
5. Never use the interior of the fryer cabinet for storage or store items on shelving over or behind the fryer. Exhaust temperatures can exceed 800°F (427°C) and may damage or melt items stored in or near the fryer.
6. Adequate distance must be maintained from the flue outlet of the fryer(s) to the lower edge of the filter bank. Per NFPA Standards No. 96, a minimum of 18-inches (45-cm) should be maintained between the flue(s) and the lower edge of the exhaust hood filter.
7. Filters and drip troughs should be part of any industrial hood, but consult local codes before constructing and installing any hood. The duct system, the exhaust hood and the filter bank must be cleaned on a regular basis and kept free of grease.

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DEAN MILLIVOLT GAS FRYERS (NON-CE)

CHAPTER 3: INSTALLATION INSTRUCTIONS

3.1 Installing the Fryer

- A. Initial Installation: If installed with legs, do not push against the fryer's side to adjust its position. Use a pallet or lift jack to lift the fryer slightly and place it where it is to be installed.
- B. Relocating the Fryer: If relocating a fryer installed with legs, remove all weight from each leg before moving.

Note: If a leg becomes damaged during movement, contact your service agent for immediate repair/replacement.

 **CAUTION**

Fryers must be at room temperature, empty of oil, and if fitted with legs, lifted during movement to avoid damage and possible bodily injury.

 **DANGER**

Hot shortening can cause severe burns. Avoid contact. Under all circumstances, oil must be removed from the fryer before attempting to move it to avoid oil spills, and the falls and severe burns that could occur. This fryer may tip and cause personal injury if not secured in a stationary position.

3.2 Leg and Caster Installation

 **WARNING**

Dean fryers equipped with legs are for permanent installations. Fryers fitted with legs must be lifted during movement to avoid damage and possible bodily injury. For a moveable or portable installation, Dean optional equipment casters must be used. Questions? Call 1-800-551-8633.

A. General

1. Install legs and rear rigid casters near where the fryer is to be used, as neither are secure for long transit. Unit cannot be curb mounted and must be equipped with the legs and casters provided.
2. When positioning the fryer, gently lower the fryer into position to prevent undue strain to the legs and internal mounting hardware. Use a pallet or lift jack to lift and position the fryer if possible. Tilting the fryer may damage the legs.
3. The rigid casters must be installed on the fryer rear channel assembly only.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 3: INSTALLATION INSTRUCTIONS**

3.2 Leg and Caster Installation (cont.)

4. Proceed to Step 3.3, Leveling the Fryer, after legs and rear rigid casters are installed to ensure the fryer is level before using.

B. Leg and Rigid Caster Installation

1. Remove unit from pallet.
2. Carefully raise unit with forklift, pallet jack, or other steady means.
3. Place one lock washer on each hex head screw.
4. Insert hex head screws with lock washers [1/4-20 threads by 3/4" long] through bolt holes of leg mounting plates and mount to the front channel. Mount rigid casters to the rear channel following the same procedure. A locknut has been attached to the topside of the base mounting plates at the factory to capture the hex head screw as it is screwed in.
5. Tighten the bolts to 50 inch-lbs. (5.65 Nm) torque.

3.3 Leveling the Fryer

- A. Place a carpenter's spirit level across the top of the fryer and level the unit front to back. If the fryer is off level side to side, a platform or other surface adjustment is needed; there is no side-to-side level adjustments on a fryer equipped with caster/leg combinations. (If a fryer is equipped with legs only, side-to-side level adjustments can be made. If a fryer is equipped with casters only, no level adjustments to the fryer can be made.) If the fryer is not level, the unit may not function efficiently, the oil may not drain properly for filtering and in a multi-fryer battery, it may not match adjacent units.

Legs (Only)

1. Adjust leg height with an adjustable or 1-1/16-inch (27 mm) open-end wrench by turning the hex bullet on the bottom of the leg.
2. The hex bullet is for minor leg height adjustment only. **Do not adjust more than 1-inch (25.4 mm).**
3. When leveling the unit, the leg body should be held firmly to keep the leg from bending or rotating while turning the hex bullet foot to the required height.

Rigid Casters (Only)

1. Install the rigid casters on the fryer rear channel only. Legs must be installed on the front channel.
2. There are no level adjustments for the rigid casters.

DEAN MILLIVOLT GAS FRYERS (NON-CE) CHAPTER 3: INSTALLATION INSTRUCTIONS

3.3 Leveling the Fryer (cont.)

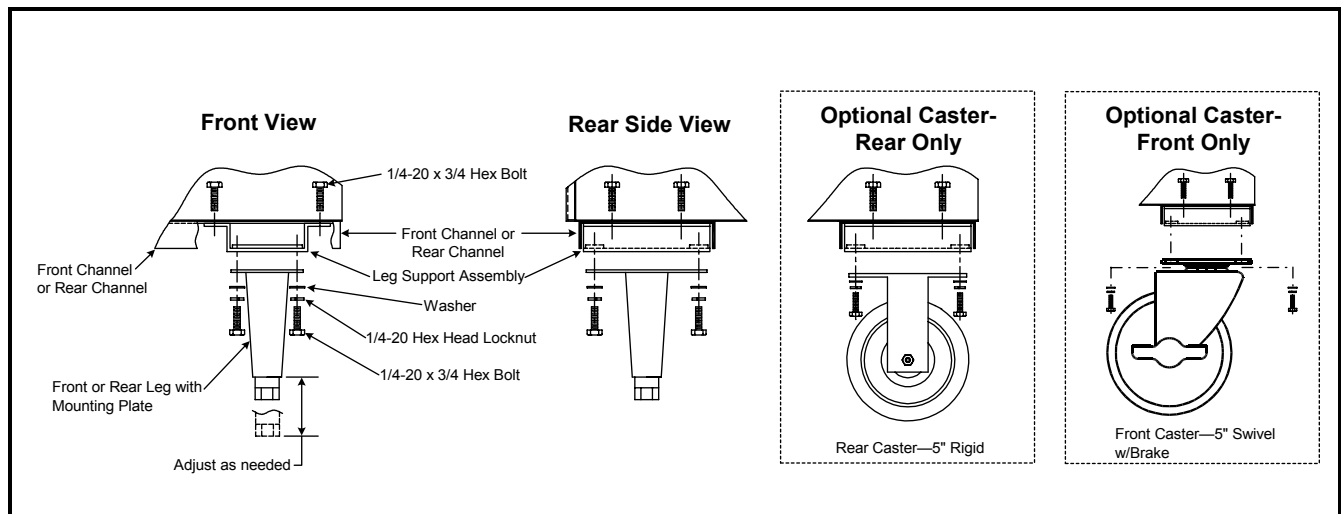
- B. If the floor is uneven or has a decided slope, place the fryer on a smooth, level platform.
- C. If the fryer is moved, re-level the fryer following the instructions given in Steps 3.3, A-C.
- D. An installed fryer must be restrained to prevent tipping, which could splash hot oil. Restraints can be straps or chains anchored to an immovable object (wall, floor anchor), or the manner of installation (installing the fryer in an alcove, battering to other appliances, etc.).

WARNING

For caster retrofit, the unit must be at room temperature and drained of shortening before installing the casters.

E. Installing Optional Swivel Casters:

1. Install non-locking casters only at the rear of the unit.
2. Locking casters must be installed at the front of the unit. Locking casters allow the fryer to be "locked" in position for safe operations.
3. Follow the same instructions for leg installations as given above in steps 3.2, B 1-5.



Leg and Caster (Optional) Mounting Installation

DEAN MILLIVOLT GAS FRYERS (NON-CE) CHAPTER 3: INSTALLATION INSTRUCTIONS

3.3 Leveling the Fryer (cont.)

NOTE: The installation must be inspected after it is complete to ensure it meets the intent of these instructions. The on-site supervisor and/or operator(s) should be informed that the appliance is installed with restraints. If restraints are removed to move fryer (cleaning beneath and behind, relocation, etc.), ensure that they are re-installed when fryer is returned to its permanently installed position.

 **DANGER**

The fryer **MUST** be connected to the gas supply specified on the rating and serial number plate located on the back of the fryer door.

 **WARNING**

If gas odors are detected, the gas supply **MUST** be shut off at the main shut-off valve. The local gas company or FASC should be contacted immediately to rectify the problem.

3.4 Gas Connections

 **DANGER**

Before connecting new pipe to this appliance the pipe must be blown out thoroughly to remove all foreign material. Foreign material in the burner and gas controls will cause improper and dangerous operation.

NATIONAL CODE REQUIREMENTS

This equipment is to be installed in compliance with the Basic Plumbing Code of the Building Officials and Code Administrators International, Inc. (BOCA) and the Food Service Sanitation Manual of the U.S. Food and Drug Administration.

This equipment is manufactured to use the type of gas specified on the rating plate attached to the door. Connect equipment stamped "NAT" only to natural gas and that stamped "PRO" only to LP (Propane) gas.

Installation shall be made with a gas connector that complies with national and local codes. Quick disconnect devices, if used, shall likewise comply with national and local codes.

 **DANGER**

The fryer **MUST** be connected to the gas supply specified on the rating and serial number plate located on the back of the fryer door.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 3: INSTALLATION INSTRUCTIONS**

3.4 Gas Connections (cont.)

The gas supply (service) line must be the same size or greater than the fryer inlet line. Super Marathon and Super Runner Series gas fryers are equipped with a 3/4" (22 mm) male ISO 7.1 inlet. The gas supply line must be sized to accommodate all gas-fired equipment connected to that gas supply. Consult local gas companies or suppliers, or your local contractor for minimum supply line requirements.

Supply Line Specifications

The gas supply lines must be sized as indicated in the chart below, based on the total number of fryers connected to the main gas supply.

Recommended Gas Supply Line Sizes			
Gas Types	Number of Fryers		
	1	2 to 3	4 or more (*)
Natural Gas	3/4" (22 mm)	1" (28 mm)	1-1/4" (35 mm)
Propane Gas	1/2" (15 mm)	3/4" (22 mm)	1" (28 mm)

(*) When exceeding 18 feet (6 meters) for a configuration of more than four fryers, it is necessary to provide a 1 1/4" (35 mm) rigid gas connection.

 **DANGER**

All connections must be sealed with a joint compound suitable for the gas being used and all connections must be tested with a solution of soapy water before lighting any pilots.

Never use matches, candles, or any other ignition source to check for leaks. If gas odors are detected, shut off the gas supply to the appliance at the main shut-off valve and immediately contact the local gas company or an authorized service agency for service.

 **DANGER**

"Dry-firing" your unit will cause damage to the frypot and can cause a fire. Always ensure that melted shortening, cooking oil or water is in the frypot before firing the unit.

DEAN MILLIVOLT GAS FRYERS (NON-CE) CHAPTER 3: INSTALLATION INSTRUCTIONS

3.4 Gas Connections (cont.)

Rigid Connections

Check any installer-supplied intake pipe(s) visually and clean metal particles or other foreign matter from the threads before installing into a service line. If the intake pipes are not clear of all foreign matter, the orifices will clog when gas pressure is applied. When using thread compound on gas piping, use very small amounts and only on male threads. Use a pipe thread compound that is not affected by the chemical action of LP gases. **DO NOT** apply thread compound to the first two pipe threads – doing so will cause clogging of the burner orifices and control valve.

Manual shut-off valve

This gas service supplier-installed valve must be installed in the gas service line ahead of the fryers in the gas stream and in a position where it can be reached quickly in the event of an emergency.

Regulating Gas Pressure

The fryer and shut-off valve must be disconnected from the gas supply during any pressure testing of the system.

External gas regulators are not normally required on this fryer. A safety control valve protects the fryer against pressure fluctuations. If the incoming pressure is in excess of ½" PSI (3.45 kPa/35 mbar), **a step-down regulator will be required.**

DANGER

When pressure-testing incoming gas supply lines, disconnect the fryer from the gas line if the test pressure is ½" PSI [3.45 kPa (14 inches W.C.)] or greater to avoid damage to the fryer's gas piping and gas valve(s).

- A. Manifold Pressure: Your local service technician should check the manifold pressure with a manometer.
1. Check the rating plate for manifold gas pressures. Natural gas units normally require 4-inches W.C., and propane units normally require 11-inches W.C. gas pressure.
 2. Confirm that the arrow forged into the bottom of the regulator body, which indicates gas flow direction, is pointed downstream towards the fryers. The air vent cap is also part of the regulator and should not be removed.
 3. If a vent line from the gas pressure regulator is used, it should be installed in accordance with local codes or in the absence of local codes, with the appropriate national standards.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 3: INSTALLATION INSTRUCTIONS**

3.4 Gas Connections (cont.)

 **WARNING**

Use a diluted soap solution to find potentially dangerous gas leaks when making new connections.

- B. Regulators: Gas regulators can be adjusted in the field, but no adjustments should be made unless the regulator is out of adjustment, or serious pressure fluctuations are observed.
- C. Only qualified service personnel should make adjustments to the regulators.
- D. Orifices: The fryer can be configured to operate on any available gas. The correct safety control valve, appropriate gas orifices, and pilot burner are installed at the factory. While the valve can be adjusted in the field, only qualified service personnel should make any adjustments with the proper test equipment.
- E. Flexible Couplings, Connectors and Casters
 - 1. If the fryer is to be installed with flexible couplings and/or quick-disconnect fittings, the installer must use a heavy-duty certified commercial flexible connector of at least 3/4" (22 mm) NPT (with suitable strain-relief attachments), in compliance with local codes or in the absence of local codes, with the appropriate national standards. Quick-disconnect devices must comply with local codes or in the absence of local codes, with the appropriate national standards.
 - 2. For an appliance equipped with casters, the installation shall be made with a connector that complies with local codes or in the absence of local codes, with the appropriate national standards.
 - 3. Under no circumstances are the connector and the quick-disconnect device, or its associated piping to be used to limit fryer movement. A restraining bracket is provided on the appliance back to prevent the unit from moving from its installed position.

 **WARNING**

**Do not attach accessories to this fryer unless fryer is secured from tipping.
Personal injury may result.**

- 4. To limit movement of the fryer, restraints independent of the flexible coupling or connector must be used. Clips are located on the back panel of the fryer for the attachment of restraints.
- 5. If disconnection of the restraint is necessary, the restraint must be reconnected after the fryer has been returned to the position it was originally installed.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 3: INSTALLATION INSTRUCTIONS**

3.4 Gas Connections (cont.)

- F. After hook up, bleed the gas line of air to ensure that the pilot light will ignite quickly and evenly.

 **WARNING**

Qualified personnel **MUST perform any adaptation, modification, or gas conversion, if required. Failure to use qualified personnel will void the Dean warranty.**

3.5 Adjustments/Adaptation To Different Gases

- A. Proper operation of appliances requires operator to scrupulously inspect the following adjustments in terms of gas inputs and pressures.
- B. Dean Super Marathon and Super Runner Series gas fryers are manufactured to use the type of gas and pressure specified on the rating plate. When changing gas, **adaptation must be performed by qualified personnel**. Failure to use qualified personnel will void the Dean warranty.

 **DANGER**

This appliance was configured at the factory for a specific type of gas. Converting from one gas type to another requires the installation of specific gas-conversion components.

Switching to a different type of gas without installing the proper conversion components may result in fire or explosion. NEVER ATTACH THIS APPLIANCE TO A GAS SUPPLY FOR WHICH IT IS NOT CONFIGURED!

Conversion of this appliance from one type of gas to another should only be performed by qualified, licensed, and authorized installation or service personnel, as defined in Section 1.5 of this manual.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 3: INSTALLATION INSTRUCTIONS**

3.6 Gas Inputs

Nominal Heat Inputs (Qn), Gas Type, Orifice Size (applicable for fryer operation at altitudes of 2000 feet or less), Part Number and Quantity are listed in the table below:

MODEL	NOMINAL HEAT INPUT- Qn (BTU)	GAS TYPE	ORIFICE SIZE (MM)	ORIFICE PART NO.	ORIFICE QUANTITY
SM 80 GM	165	NAT	2.58(#38)	810-2062	5
		LP	1.61(#52)	810-2063	5
SM 60 GM SR 62G	150	NAT	2.53(#39)	810-2048	5
		LP	1.51(#53)	810-2059	5
		LP	1.61(#52)**	810-2063**	5
SR 52 GM SM 50 GM	120	NAT	2.53(#39)	810-2048	4
		LP	1.51(#53)	810-2059	4
SM 35 GM SR 42G	105	NAT	2.80(#35)	810-2040/*810-3097	3
		LP	1.70(#51)	810-2064/*810-3099	3
SM 20 GM	50	NAT	2.18(#44)	810-2050	2
		LP	1.40(#54)	810-2324	2

* Use these orifices on SR42 fryers built after 4/07.
** Use these orifices for Australian units.

A. Adjustments for different gases are as follows:

Gas Adjustments		
Gas Type	Natural	LP
Gas Supply Pressure*	4" W.C. (10 mbars)	11" W.C. (27.5 mbars)
Orifice Diameter	See Table Above.	See Table Above.
Burner Marking	None	None
Pilot Marking	26N	16LP
Gas pressure at the regulator [Inches W.C. (mbar)]*	4" W.C. (10 mbars)	11" W.C. (27.5 mbars)

NOTE: Outlet gas pressure must be adjusted strictly within the above requirements 5 to 10 minutes after the appliance is operating.

DEAN MILLIVOLT GAS FRYERS (NON-CE) CHAPTER 3: INSTALLATION INSTRUCTIONS

3.7 Gas Conversion Procedures

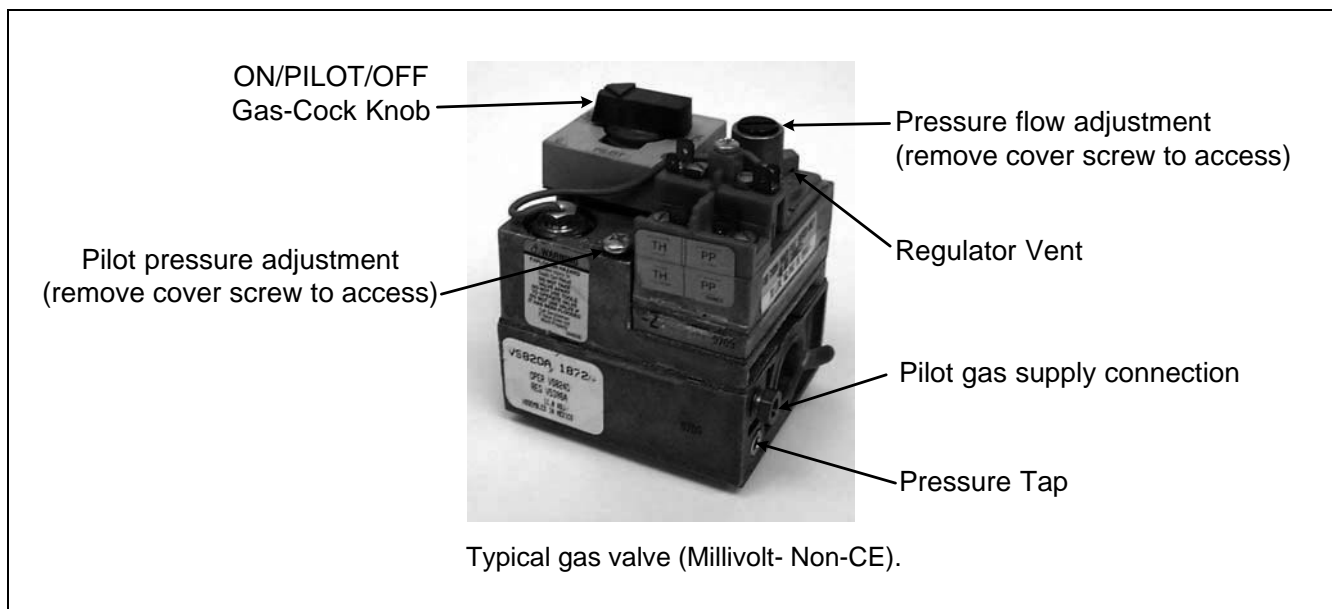
See gas valve illustration below and gas valve, burner and orifice location on page 3-11 when performing the following conversions.

When converting from natural gas to propane (or vice-versa), the following procedures apply:

- ◆ Burner orifices and pilot orifice **MUST** be replaced (See page 3-9 for required component part numbers).
- ◆ Adjust orifice gas pressure by turning the gas-valve adjustment screw (See page 3-9 for various gas types and pressures).
- ◆ After adjustment, replace the adjustment-screw cover.
- ◆ Affix the new label included with the conversion kit next to the existing rating plate stating that the gas type has been converted. Remove any references to the previously used gas from the existing rating plate.

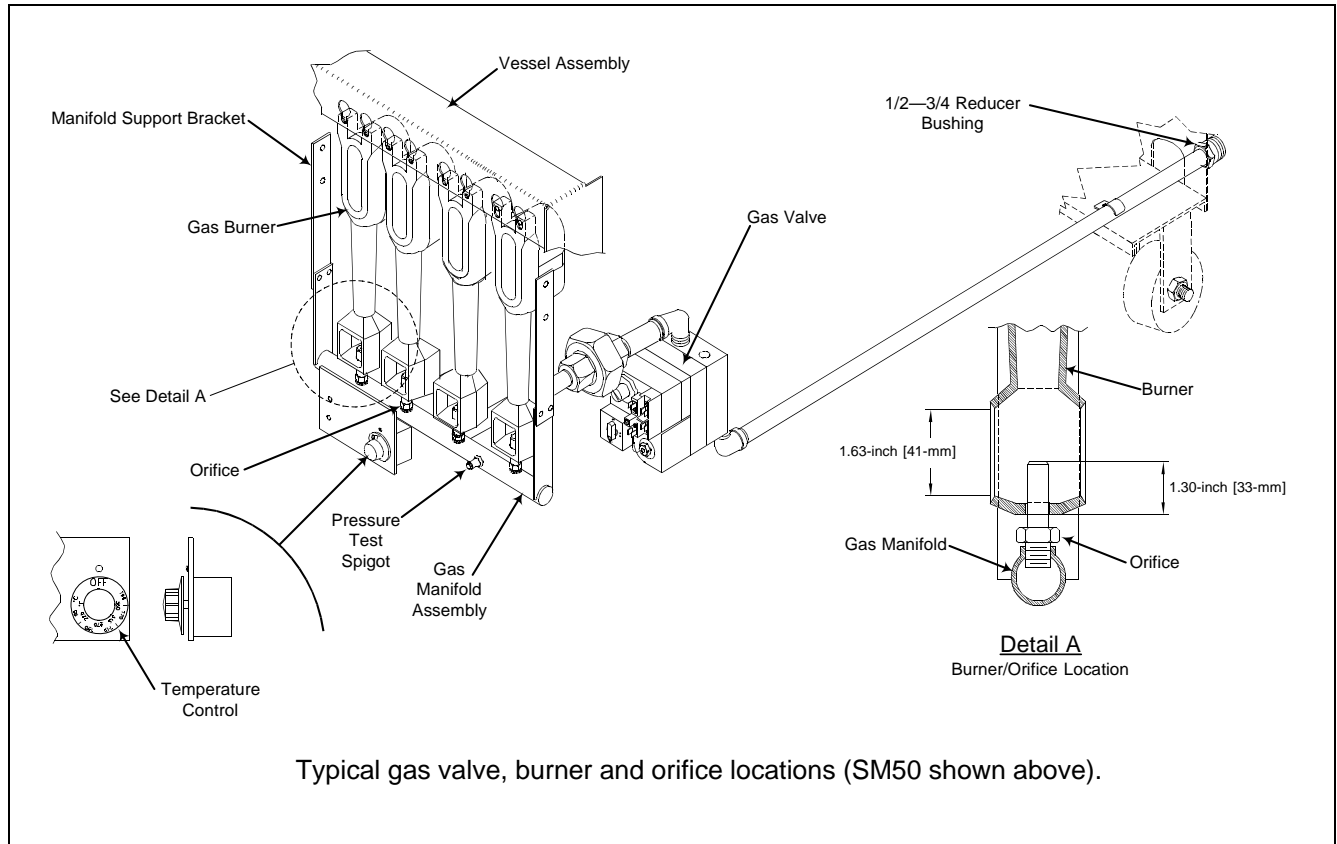
Conversion from one gas family to another (i.e. changing from natural gas to propane) requires special components. Obtain the necessary components using the tables on page 3-9.

Conversions can only be executed by qualified, factory-authorized personnel.



DEAN MILLIVOLT GAS FRYERS (NON-CE) CHAPTER 3: INSTALLATION INSTRUCTIONS

3.7 Gas Conversion: Procedures (cont.)



3.8 Gas Conversion Components

Use the following components to convert from natural gas to propane and vice-versa. See Section 3.6 for orifice quantities required for conversion.

Natural Gas to Propane Kit, 826-1817	Propane To Natural Gas Kit, 826-2017
Bushing, NPT Flush, SR 42 Series only	Bushing, NPT Flush, SR 42 Series only
Pilot orifice (16LP)	Pilot orifice (26N)
Burner orifice* (See Table on Page 3-9)	Burner orifice* (See Table on Page 3-9)
Rating label, contact factory at time of conversion.	Rating label, contact factory at time of conversion.

* Burner orifices listed on page 3-9 are for fryers operating at altitudes of 2000 feet or less. For altitudes greater than 2000 feet, contact the factory for the correct orifice size.

**DEAN MILLIVOLT GAS FRYERS (NON-CE)
CHAPTER 3: INSTALLATION INSTRUCTIONS**

3.9 Electrical Connections

Fryers without built-in filtration do not require electrical connection. Fryer systems with built-in filtration when installed must be electrically grounded in accordance with local codes, or in the absence of local codes, with the appropriate national standards.

 **WARNING**

Fryers with built-in filtration systems are equipped with a three-prong (grounding) plug for protection against shock hazard. It should be plugged directly into a properly grounded, three-prong receptacle. DO NOT CUT, REMOVE, OR OTHERWISE BYPASS THE GROUNDING PRONG ON THIS PLUG.

For fryers with built-in filtration systems: The rating plate and wiring diagram are located on the inside front door panel. Built-in filtration systems are equipped with 120VAC single-phase 60-hertz system (Domestic), or 230VAC single-phase 50-hertz system (International/CE). Do not cut or remove the ground prong from the power cord plug.

 **DANGER**

This appliance requires electrical power (built-in filtration systems only) for operation. Place the gas control valve in the OFF position in case of a prolonged power outage. Do not attempt to operate this appliance during a power outage.

DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE)

CHAPTER 4: FRYER OPERATIONS

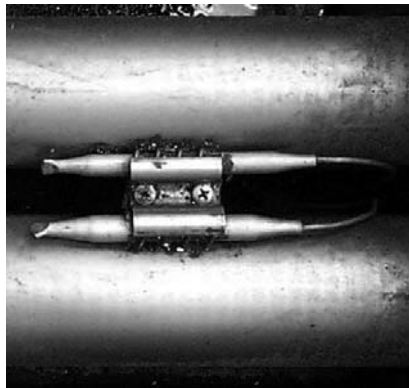
4.1 Initial Start-up

WARNING

The on-site supervisor is responsible for ensuring that operators are made aware of the inherent hazards of operating a hot oil frying system, particularly the aspects of system operation, oil filtration, draining and cleaning procedures.

Cleaning: New units are wiped clean with solvents at the factory to remove any visible signs of dirt, oil, grease, etc. remaining from the manufacturing process, then coated lightly with oil. Before any food preparation, wash thoroughly with hot, soapy water to remove any film residue and dust or debris then rinse out and wipe dry. Also wash any accessories shipped with the unit. Close the drain valve completely and remove the crumb screen covering the heating tubes. Ensure the screws holding the thermostat and high-limit control sensing bulbs into the frypot are tight.

Typical high-limit/sensor probe location and mounting hardware.



WARNING

Do not bang fry baskets or other utensils on the fryer's joiner strip. The strip is present to seal the joint between the frypot. Banging fry baskets on the strip to dislodge shortening will distort the strip, adversely affecting its fit. It is designed for a tight fit and should only be removed for cleaning.

DANGER

Never operate this appliance with an empty frypot. The frypot must be filled with water or cooking oil/shortening before lighting the burners. Failure to do so will damage the frypot and may cause a fire.

WARNING

When checking for burner ignition or performance, do not get too close to the burners. Slow ignition can cause possible flashback, increasing the potential for facial and body burns.

DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE) CHAPTER 4: FRYER OPERATIONS

4.1.1 Pilot Lighting Procedures, Standing Pilot Only

Initial Pilot Lighting: All Dean fryers are tested, adjusted and calibrated to sea level conditions before leaving the factory. Adjustments to assure proper operation of pilot may be necessary on installation to meet local conditions, low gas pressure, differences in altitude and variations in gas characteristics. These adjustments correct possible problems caused by rough handling or vibration during shipment, and are to be performed only by qualified service personnel. These adjustments are the responsibility of the customer and/or the dealer and are not covered by the Dean warranty.

The inlet pipe at the lower rear of the fryer brings incoming gas to the pilot safety control valve, then to the pilot and main burners. The pilot is located high in the cabinet center, at the base of the frypot.

Light the pilot as follows:

1. Turn off the manual shut-off valve on the incoming service line.
2. Turn the operating thermostat off.
3. Depress the pilot gas cock dial on the combination control valve and turn to "OFF".
4. Wait approximately 5 minutes for accumulated gas to disperse.

Note: Inspect high-limit thermostat/temperature probe location prior to filling frypot with water or oil. Ensure that connecting hardware is intact and bulbs are properly attached.

5. Fill the frypot with oil or water to the bottom OIL LEVEL line scribed on the frypot back. Ensure that heating tubes are covered in liquid prior to engaging burners.
6. Open the manual shut-off valve on the incoming service line.
7. Apply lighted match or taper to the pilot burner head.
8. Turn the gas cock dial on the control valve to "Pilot", then depress and hold the dial until the pilot stays lit (approximately 1 minute).
9. If the pilot fails to stay lit, depress the dial and re-light the pilot, depressing the dial longer before releasing.
10. When the pilot stays lit, turn the gas cock dial to "ON".
11. Turn the operating thermostat on, then ensure the main burners ignite from the pilot.

**DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE)
CHAPTER 4: FRYER OPERATIONS**

4.2 Boil-Out Procedure

 DANGER

Never leave the fryer unattended during the boil-out process. If the boil-out solution boils over, turn the fryer off immediately and let the solution cool for a few minutes before resuming the process. To lessen the chance of boil over, turn the fryer's gas valve knob to the PILOT position occasionally.

 WARNING

Do not drain boil-out solution into a shortening disposal unit, a built-in filtration unit, or a portable filter unit. These units are not intended for this purpose, and will be damaged by the solution.

 DANGER

Remove all drops of water from the frypot before filling with cooking oil or shortening. Failure to do so will cause spattering of hot liquid when the oil or shortening is heated to cooking temperature and may cause injury to nearby personnel.

4.2.1 Thermostat-Equipped Fryers

- A. Pour cleaning solution into the frypot and add water to the bottom OIL LEVEL line scribed in the back of the frypot.
- B. Set the operating thermostat dial/temperature controller to 225°F (107°C), just above that of boiling water.
- C. The main burner will ignite.
- D. When the solution nears boiling point, reset the temperature controller to 200°(93°C).
- E. The burners should shut off just as the water starts to boil.
- F. The burners will heat the boil-out solution to a simmer. Simmer the solution for approximately 45 minutes. Wearing protective gloves, scrub the sides of the frypot and the tubes with the L-shaped Teflon brush, being careful not to disturb the temperature sensing probes and the high-limit thermostat.
- G. Do not allow the water level to decrease below the bottom OIL LEVEL line in frypot during boil-out operation.

**DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE)
CHAPTER 4: FRYER OPERATIONS**

4.2.1 Thermostat-Equipped Fryers (cont.)

 **WARNING**

Water or boil-out solution **MUST not be allowed to drain into the filter pan or filter system. Irreversible damage will result if water is allowed into the system.**

- H. After boil out is complete, turn the thermostat dial to "OFF" and drain the solution from the frypot. Place a metal stockpot of sufficient size to safely hold the entire contents of the frypot under the drain port to collect the water/boil-out solution. Do not allow water or boil-out solution to drain into the filter pan. The filter pump is not designed for water operation, and will be irreparably damaged (see warning statement above).
- I. Close the drain, add fresh water (without boil-out solution) and wash all surfaces of the frypot. Drain again.
- J. Refill the frypot with fresh water and vinegar to neutralize any residual boil-out solution. Wash all surfaces of the frypot. Drain completely and wipe down all surfaces of the frypot to completely remove all water.

NOTE: It is recommended that the boil-out procedure be performed each time the oil/shortening is changed.

 **DANGER**

Do not go near the area directly over the flue outlet while the fryer is operating.

Always wear oil-proof, insulated gloves when working with the fryer filled with hot oil.

Always drain hot oil into a metal stockpot of sufficient size to safely hold the entire contents of the frypot.

4.3 Final Preparation

 **WARNING**

****NEVER** set a complete block of solid shortening on top of heating tubes. To do so will damage the heating tubes and frypot, and void the warranty.**

4.3.1 Filling Fryer with Cooking Oil/Shortening—Operating Thermostat

- A. When using a liquid shortening (cooking oil), fill the fryer to the bottom OIL LEVEL line scribed into the back of the frypot.

**DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE)
CHAPTER 4: FRYER OPERATIONS**

4.3.1 Filling Fryer with Cooking Oil/Shortening—Operating Thermostat (cont.)

- B. When using a solid shortening, first melt it in a suitable container, or cut it into small pieces and pack it below the heat tubes, between the tubes and on top of the tubes, leaving no air spaces around the tubes. Do not disturb or bend the sensing bulbs.
- C. If the shortening is not pre-melted and is packed around the tubes, turn the burners "ON" for about 10 seconds, "OFF" for a minute, etc., until the shortening is melted. If you see smoke coming from the shortening while melting this way, shorten the "ON" cycle and lengthen the "OFF" cycle. Smoke indicates potential scorching of the shortening, which will shorten its useful life.
- D. Before starting operation, turn the operating thermostat to the probable working temperature; wait for the temperature to stabilize then check with a high-quality immersion thermometer.

For filtration instructions and troubleshooting, consult the operating manual or instructions provided with the filtration equipment.

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DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE)

CHAPTER 5: PREVENTATIVE MAINTENANCE

5.1 General

 **DANGER**

Never attempt to clean the fryer during the cooking process or when the frypot is filled with hot oil/shortening. If water comes in contact with oil/shortening heated to cooking temperature, it will cause spattering of the oil/shortening, which can result in severe burns to nearby personnel.

Any equipment works better and lasts longer when maintained properly and kept clean. Cooking equipment is no exception. Dean millivolt gas fryers should be kept clean during the working day and thoroughly cleaned at the end of each day. Below are recommendations for daily, weekly and periodic preventative maintenance.

5.1.1 Daily

 **WARNING**

Use a commercial grade cleaner formulated to effectively clean and sanitize food-contact surfaces. Read the directions for use and precautionary statements before use. Particular attention must be paid to the concentration of cleaner and the length of time the cleaner remains on the food-contact surfaces.

- A. Remove and wash all removable parts.
- B. Clean all exterior surfaces of the cabinet. Do not use cleaners, steel wool, or any other abrasive material on stainless steel.
- C. Filter the cooking oil and replace if necessary. The oil should be filtered more frequently when under heavy use.

5.1.2 Weekly

- A. Completely drain the oil from the fryer into a metal stockpot of sufficient size to safely hold the entire contents of the frypot for disposal. Do not use a glass or plastic container.
- B. Clean the frypot by following boil-out procedures in Chapter 4-2.

 **WARNING**

Never allow water to boil down and expose the heating tubes. Frypot damage will result.

DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE)
CHAPTER 5: PREVENTATIVE MAINTENANCE

5.1.3 Periodic/ Annual

The fryer should be inspected and adjusted periodically by qualified service personnel as part of a regular kitchen maintenance program.

Dean recommends that the fryer be inspected at least annually by a Factory Authorized Service Technician as follows:

- Inspect fryer cabinet inside and out, front and rear, for excessive oil build-up and/or oil migration. Verify that burners and associated components (i.e. gas valves, pilot assemblies, ignitors, etc.) are in good condition and functioning properly. Inspect all gas connections for leaks and ensure all connections are properly tightened.
- Verify that temperature and high-limit probes are properly connected, tightened and functioning properly.
- Verify that all electronic components (i.e. computer/controller, relays, transformers, interface boards, etc.) are in good condition and free from oil migration build-up and other debris. Inspect any wiring and ensure all connections are tight and all wiring is in good condition. Ensure all safety features (i.e. drain safety switches, reset switches, etc.) are present and functioning properly.
- Verify that frypot is in good condition and free of leaks. Verify that frypot tube diffusers are present and in good condition (i.e. no visible deterioration or damage).
- Verify that all wiring and connections are tight and in good condition.

See filtration manual for filtration maintenance procedures.

5.1.4 Stainless Steel Care



DO NOT let water splash into the tank of hot oil. It will splatter and can cause severe burns.

All stainless steel fryer cabinet parts should be wiped regularly with hot, soapy water during the day, and with a liquid cleanser designed for stainless steel at the end of each day.

- A. Do not use steel wool, abrasive cloths, cleansers or powders.
- B. Do not use a metal knife, spatula or any other metal tool to scrape stainless steel! Scratches are almost impossible to remove.
- C. If it is necessary to scrape the stainless steel to remove any encrusted materials, soak the area first to soften the deposit, then use a wood or nylon scraper only.

DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE)

CHAPTER 6: TROUBLESHOOTING

6.1 General

 **DANGER**

Hot cooking oil/shortening will cause severe burns. Never attempt to move this appliance when filled with hot cooking oil/shortening or to transfer hot cooking oil/shortening from one container to another.

The problems and possible solutions covered are those most commonly encountered. To troubleshoot, perform the test set-up at the beginning of each condition. Follow each step in sequence.

6.2 Pilot Burner Malfunction

- A. Pilot will not ignite; no evidence of gas at pilot burner.
 - 1. Check that gas valve is open and gas is present at the gas valve.
 - 2. Check pilot burner orifice for dirt or lint.
 - 3. Remove pilot burner gas-supply line and check for contamination; blow out if necessary, then reinstall.
- B. Pilot burner ignites but will not remain lit when gas valve manual knob is released.
 - 1. Check that thermocouple lead is properly screwed into thermocouple connection bushing on gas valve.
 - 2. Remove end of thermocouple lead from thermocouple connection bushing and clean with fine sandpaper or emery cloth.
 - 3. Pilot flame may be too high or too low. Adjust pilot flame adjustment screw so that pilot flame extends about 3/4-inch (22-mm) above the top of the pilot burner.
 - 4. Check all connections for cleanliness and security.
- C. Pilot flame of proper size, but is unstable. Flame wavers and does not envelope the thermocouple completely at all times.
 - 1. Check for drafts that might be caused by air conditioning equipment or make-up air apparatus. Turn air-moving equipment off and recheck the pilot.

DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE)
CHAPTER 6: TROUBLESHOOTING

6.3 Main Burner Malfunctions

- A. Main burner will not come "ON"; gas not detected at main burner.
 - 1. Check that the gas valve is open.
 - 2. Check that the pilot is ignited and is operating properly.
 - 3. Check the high limit switch for continuity.
 - 4. The combination gas valve may be defective; replace if necessary.

- B. Main burner flames are small and appear lazy; shortening does not come up to temperature quickly.
 - 1. Check gas pressure at the pressure tap of the gas valve. Use dial type or standard water-type U-gauge manometer. With burner in operation, the pressure should be 4" W.C. (10 mbar) for natural gas, and 11" W.C. (27.5 mbar) for propane.
 - 2. If not, remove the pressure regulator adjustment cover. Use screwdriver to turn the adjusting screw for proper pressure. Replace cover, re-check pressure and re-install pressure regulator adjustment cover.

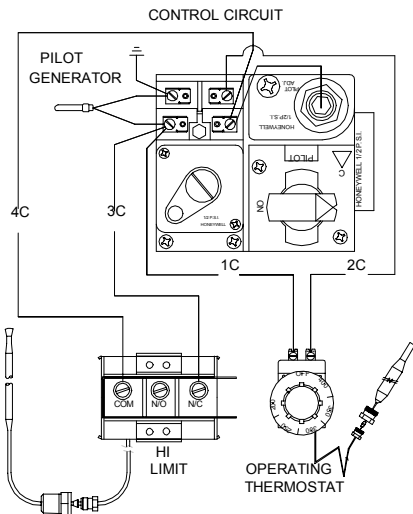
- C. Signs of excessive temperature; shortening scorches and quickly becomes discolored.
 - 1. Check operating thermostat. May be out of adjustment or calibration. Recalibrate if necessary.
 - 2. Check gas pressure as outlined above.
 - 3. Shortening used is of inferior quality and/or shortening has been used too long. Replace shortening.
 - 4. Ensure frypot is clean when refilling with new shortening.

- D. Fryer will not reach the temperature setting and/or runs erratically.
 - 1. Incorrect location of sensor probe or defective temperature sensor.
 - 2. Loose wiring/wire connection.

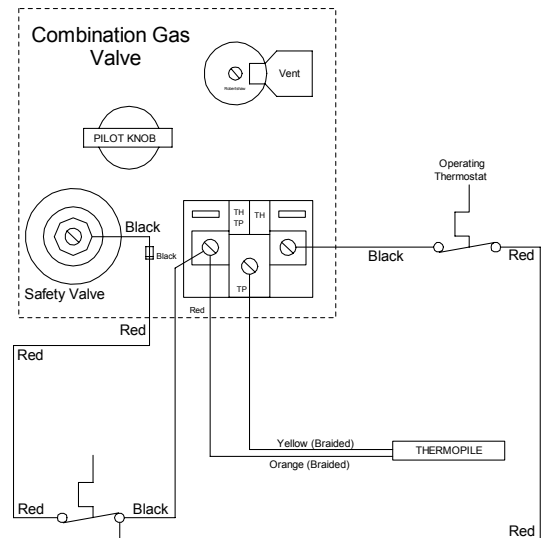
- E. Fryer shortening temperature cannot be controlled; fryer runs at high-limit temperature.
 - 1. Defective operating thermostat or temperature probe.
 - 2. Call Service Technician.

DEAN MILLIVOLT SERIES GAS FRYERS (NON-CE) CHAPTER 6: TROUBLESHOOTING

6.4 Wiring Diagrams



Honeywell Millivolt Gas Valve Wiring



Robertshaw Millivolt Gas Valve Wiring

6.5 Recommended Spare Parts

Commonly replaced parts in older Dean Millivolt gas (Non-CE) fryers are:

- Gas Valve (Honeywell)- Natural- 807-1603
- Gas Valve (Honeywell)- LP- 807-1604
- Gas Valve (Robertshaw)- Natural- 807-3645
- Gas Valve (Robertshaw)- LP- 810-2399
- High-limit Thermostat- 435°F Automatic Reset- 807-3516
- High-limit Thermostat- 450°F Manual Reset- 807-3680
- Thermopile- 810-2033
- Thermostat, Operating- 807-3515
- Knob, Thermostat- 816-0546



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